

Japanese Utility Model Kokai No. 02-52874

Laid-opening date: 17 April 1990

Application No.: 63-133926

Filing date: 12 October 1988

Applicant: Taiyo Plant Co., Ltd., Osaka

Title: Folding device of polyethylene bag

Claims:

1. Device for folding a polyethylene bag, in which a pair of folding drums (8), (8') having the same diameter are arranged, the outer peripheral faces thereof being in parallel with each other, concave grooves (10), (10') and shearing and pressing-in projections (13), (13') are axially located on the outer peripheral faces of said folding drums (8), (8') while keeping 90° spaces respectively so as to form a rotating positional phase so that the concave grooves (10), (10') and projections (13), (13') of the opposing folding drums (8), (8') may correspond alternately, opening/closing members (12), (12') are mounted to the concave grooves (10), (10') via transverse shafts (11), (11'), suction faces (14), (14') are integrally provided facing opposite to said opening/closing members (12), (12'), and the device is equipped with a pair of folding press bars (32), (32') arranged beneath said folding drums (8), (8') so as to be able to move alternately, intermittently and vertically being in conjunction with said folding drums (8), (8'), characterized in that

a guiding and receiving box (34-1) is located beneath said folding drums (8), (8') and the folding press bars (32), (32'), said box being configured such that both the side walls (34-3) are elongated backwards so as to store and guide the polyethylene bag folded in a zig-zag form alternately, a feed roller (34-4) is provided in the upper position of said guiding and receiving box (34-1), and a feed

belt (34) is positioned in the lower portion of said box (34-1).

2. The device for folding a polyethylene bag according to claim 1, wherein the feed roller (34-4) provided in the upper position of said guiding and receiving box (34-1) is rotatably located in the rear portion of the falling port (34-2) of said guiding and receiving box (34-1).

Detailed Description of the Invention:

(a) INDUSTRIAL FIELD OF THE INVENTION

This invention relates to a device for folding, alternately and in a zig-zag form, a thin plastics bag such as polyethylene bag.

(f) EMBODIMENT

The invention will now be described more in detail, by way of an embodiment, with reference to the accompanying drawings. Fig. 1 is an entire perspective view of the folding device of a polyethylene bag. In the drawings, (A) designates a feeding device of polyethylene tubes (P), (P'), in which two polyethylene tube rolls (1), (1') are rotatably shaft bridged on the frame (f) side face via mounting shafts (2), (2'). The reference numerals (3), (3') show tension rolls which suitably impart a tension to the taking-out polyethylene tubes (P), (P'). Behind the feeding-out device (A) there are positioned seal mechanisms (B), (B') that form a seal portion (5) transversely while heating the polyethylene tubes (P), (P') by heaters (4), (4') at predetermined intervals, and said seal mechanisms (B), (B') are configured such that the polyethylene tubes (P), (P') are passed between the feed rolls (6), (6') and the heaters (4), (4'). Then, sealing is performed on the feed rolls (6), (6') by the rotary heaters (4), (4').

Further, behind the seal mechanisms (B), (B') a folding mechanism

(C) is positioned.

The folding mechanism (C) is provided with rubber-made guide rolls (7), (7') as shown in Fig. 2 thereby to supply the polyethylene tubes (P), (P') along the folding drums (8), (8') by said guide rolls (7), (7'). The reference numerals (9), (9') show rubber-made touch rolls for pressing the polyethylene tubes (P), (P') onto the folding drums (8), (8'). References (9-1), (9-1') are static electricity removal devices provided in the front position of the guide rolls (7), (7'), and they are located close to the polyethylene tubes (P), (P').

Further, concave grooves (10), (10') are formed axially while keeping 180° intervals, on the outer peripheral surfaces of the folding drums (8), (8'), traverse shafts (11), (11') are shaft bridged in said concave grooves (10), (10'), and said traverse shafts are mounted with opening/closing members (12), (12'). Then, said members (12), (12') are empowered by respective springs (12-1), (12-1').

Furthermore, in the upper portion of the guide rolls (7), (7') there are positioned pressing-in members (7-2), (7-2') that intermittently press-in the polyethylene tubes (P), (P') into the concave grooves (10), (10') of said folding drums (8), (8'), in conjunction with rotary cam bodies (7-1), (7-1').

Moreover, pointed convex portions (7-3), (7-3') are provided at the tips of said pressing-in members (7-2), (7-2'), and rotating rollers (7-4), (7-4') are rotatably provided in the rear portion thereof.

The numeral (7-5) designates a cam shaft, (7-6) a support shaft for the rotating roller (7-4), and (7-7) a tension spring for the pressing-in member (7-2).

The numerals (13), (13') designate shearing and pressing-in

projections which are provided being deviated at 90° intervals relative to said opening/closing members (12), (12').

Then, in said projections (13), (13'), as shown in Fig. 7 and Fig. 8, traverse grooves (13-1), (13-1') are axially provided on the outer peripheral surfaces of the folding drums (8), (8') whereby the projections (13), (13') are disappearingly provided in said traverse grooves (13-1), (13-1'). The references (13-2), (13-2') are suction passages provided in a concave form in both the base sides of the projections (13), (13'), and they coincide with suction passages (13-3), (13-3') provided in said traverse grooves (13-1), (13-1') sides. Then, actuation shafts (13-4), (13-4') are provided beneath the projections (13), (13') so as to appear and disappear via link members (13-5), (13-5'). The end of the actuation shaft (13-4) is provided with a roller (13-7) and an actuation arm (13-8) which abut against a rotary cam (13-6). The reference (13-9) designates a tension spring and (13-10) a concave insertion part provided in the rotary cam (13-6).

The reference numerals (14), (14') are adsorption faces provided in the concave grooves (10), (10') of the folding drums (8), (8'), they are positioned opposite to the opening/closing members (12), (12'), and said adsorption faces (14), (14') are provided with a plurality of suction holes (15), (15').

Then, air passages (17), (17') are connected to said suction holes (15), (15') in the adsorption face sides thereby to communicate with the traverse passages (18), (18') traversely disposed in the folding drums (8), (8').

Further, air passages (19), (19') are connected to the suction passages (13-2), (13-2') in the projection sides so as to communicate with transverse passages (20), (20') traversely disposed in the folding drums (8), (8').

Furthermore, the references (21), (21') show switching valves provided coaxially at the ends of the folding drums (8), (8'), the inner peripheral portions thereof are provided, in separation, with vacuum paths (22), (22') and compressed air paths (23), (23'), and vacuum paths (22), (22') are configured at intervals wider than the compressed air paths (23), (23'). Then, drum side plates (21-1), (21-1') are located, as shown in Fig. 4, between the left position of said folding drums (8), (8') and the switching valves (21), (21') so as to be always in sliding contact with the switching valves (21), (21').

Moreover, the drum side panels (21-1), (21-1') are provided with a support hole (21-2) which shaft suspends the traverse shafts (11), (11'), while providing a connection pass (21-3) connected to said traverse passages (18), (18') and a connection pass (21-4) connected to the traverse passages (20), (20'). Of said connection passes (21-3), (21-4), the connection pass (21-3) side connected to the adsorption face side traverse passage (18) is configured in broader width.

Further, said adsorption face side traverse passage (18) is made broader in width than the pressing-in projection side passage (20). The references (24), (24') are operation levers provided at the right ends of the traverse shafts (11), (11') provided in said folding drums (8), (8'), and while having a rotating roller (25) at the end said rotating roller (25) rotatingly moves on cam bodies (27), (27') formed on right side support shafts (26), (26').

The references (28), (28') are return springs bridged over the operation levers, (29) is a stopper pin for the return spring, and (30) is a left side support shaft of the folding drums (8), (8').

The references (31), (31') designate concave grooves bored peripheral direction on the outer peripheral surfaces of the folding

drums (8), (8'), and said concave grooves (31), (31') are fittable with a pair of folding, pressing-in bars (32), (32') so as to be alternately movable intermittently and vertically in conjunction with the rotation of the folding drums (8), (8').

The numerals (33), (33') designate the base support shafts of the pressure bars (32), (32') which bent upwardly at their tips. The numeral (32) is a feed belt provided beneath the folding drums (8), (8'). Further, in Fig. 16, (34-1) is a guiding, receiving box in which the falling port (34-2) is positioned in the lower portion of the contact position of said folding drums (8), (8'), and it is located in the upper portion of said feed belt (34). The numeral (34-3) shows right and left side walls which are configured elongated rearwards. Furthermore, the numeral (34-4) is a feed roller rotatably positioned in the rear portion of the falling port (34-2), and it is supported to the traverse shaft (34-5). The numerals (35), (35') show shearing blades which are positioned to correspond to the pressing-in projections (13), (13') in the upper position of said folding drums (8), (8').

The numerals (36), (36') show concave portions provided on the outer peripheral surfaces of the touch rolls (9), (9'). Further, (37), (37') are pressurizing springs that always pressurize the switching valves (21), (21') positioned in the sliding contact on the side surfaces of the folding drums (8), (8'), to the side surfaces of said drums from the outside.

Moreover, the reference (38) shows a vacuum pump connected to the vacuum passages (22), (22') of said switching valves (21), (21'), and (39) a compressed air pipe connected to the compressed air passages (23), (23').

Brief Description of the Drawings:

The drawings show one embodiment of the invention, in which

Fig. 1 is a perspective view of the entire device of the present invention;

Fig. 2 is a side, sectional view of the essential parts of the present device;

Fig. 3 is a plan view of the essential parts;

Fig. 4 is an enlarged side, sectional view of the same;

Fig. 5 is a plan view of the same;

Fig. 6 is a detailed, plan view of the same;

Fig. 7 is a side, sectional view of the same;

Fig. 8 is an enlarged, side view of the essential parts;

Fig. 9 is a side view of the essential part of the invention;

Fig. 10 is a sectional view taken along the I-I line of Fig. 9;

Fig. 11 is an enlarged, side, sectional view of an essential part;

Fig. 12 is a perspective view of an essential part;

Fig. 13 to Fig. 15 are enlarged, side, sectional views showing the operation conditions; and

Fig. 16 is a perspective view of the essential part of the invention.

In the drawings:

(7), (7')...Guide rolls

(9), (9')... Touch rolls

(8), (8')... Folding drums

(10), (10') ...Concave grooves

(11), (11') ...Traverse shafts

(12), (12') ...Opening/closing members

(13), (13') ...Projections

(13-2), (13-2') ...Suction passages

(13-3), (13-3') ...Suction passages

(14), (14') ... Adsorption faces

- (17), (17'), (19), (19') ... Air passages
- (18), (18'), (20), (20') ... Traverse paths
- (21), (21') ... Switching valves
- (21-1), (21-1') ... Drum side panels
- (21-3), (21-3') ... Connection passes
- (22) ... Vacuum pass
- (23) ... Compressed air pass
- (34) ... Feed belt
- (34-1) ... Guiding, receiving box
- (34-2) ... Falling port
- (34-3) ... Side wall
- (34-4) ... Feed roller

## ⑫ 公開実用新案公報 (U)

平2-52874

⑬ Int. Cl. 5

B	65	H	45/16
B	31	B	1/26
B	65	H	45/28

識別記号

3 2 1

庁内整理番号

8712-3F
8818-3E
8712-3F

⑭ 公開 平成2年(1990)4月17日

D

審査請求 未請求 請求項の数 2 (全5頁)

⑮ 考案の名称 ポリエチレン袋折りたたみ装置

⑯ 実 願 昭63-133926

⑰ 出 願 昭63(1988)10月12日

⑮ 考案者 山内 幸雄 福岡県糸島郡二丈町大字松末1086-5 太洋プラント株式会社福岡工場内  
 ⑯ 出願人 太洋プラント株式会社 大阪府大阪市淀川区西宮原3丁目3番19号  
 ⑰ 代理人 弁理士 松尾 慶一郎

## ⑮ 実用新案登録請求の範囲

- 1 同一径の一対の折りたたみドラム 8, 8' をその外周面を互いに平行に配置し、前記折りたたみドラム 8, 8' の外周面にそれぞれ90°間隔をおいて軸心方向に凹溝 10, 10' と切断・押込み用凸条 13, 13' を位置させて、対向する折りたたみドラム 8, 8' の凹溝 10, 10' と凸条 13, 13' が互いに對応するように回転位相をもたせ、同凹溝 10, 10' に横軸 11, 11' を介して開閉部材 12, 12' を装着すると共に、同開閉部材 12, 12' に對向して吸着面 14, 14' を一体的に設け、かつ、上記折りたたみドラム 8, 8' の下側位置に同折りたたみドラム 8, 8' に連動して交互に間欠上下動し得るように配置した一対の折りたたみ用押え棒 32, 32' を具備するポリエチレン袋折りたたみ装置において、上記折りたたみドラム 8, 8' 及び折りたたみ押え棒 32, 32' の下側に、交互にジグザグ状に折りたたまれたポリエチレン袋を収納案内すべく両側壁 34-3 を後方に長く構成した案内用受箱 34-1 を位置させて、同案内用受箱 34-1 の上部位置には送りローラー 34-4 を設けると共に、案内用受箱 34-1 の下部には、送りベルト 34 を位置させたことを特徴とするポリエチレン袋折りたたみ装置。
- 2 上記案内用受箱 34-1 の上部位置に設ける送りローラー 34-4 は、案内用受箱 34-1 の落下口 34-2 の後部に回転自在に位置させ

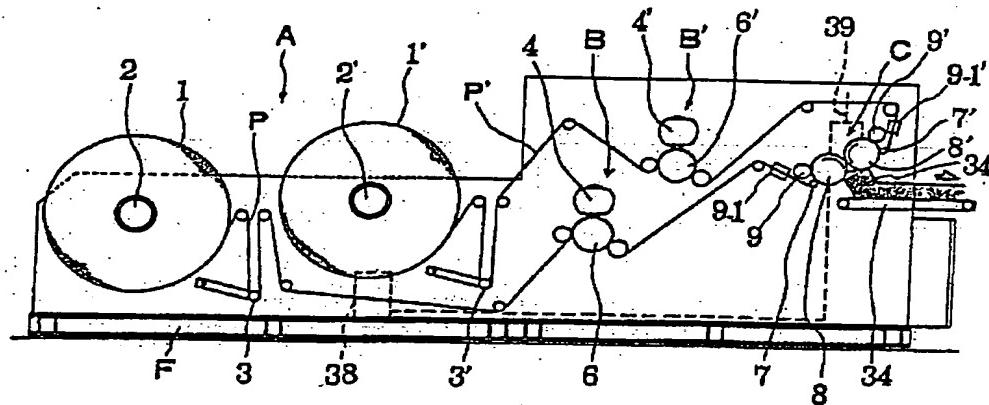
たことを特徴とする実用新案登録請求の範囲第1項記載のポリエチレン袋折りたたみ装置。

## 国面の簡単な説明

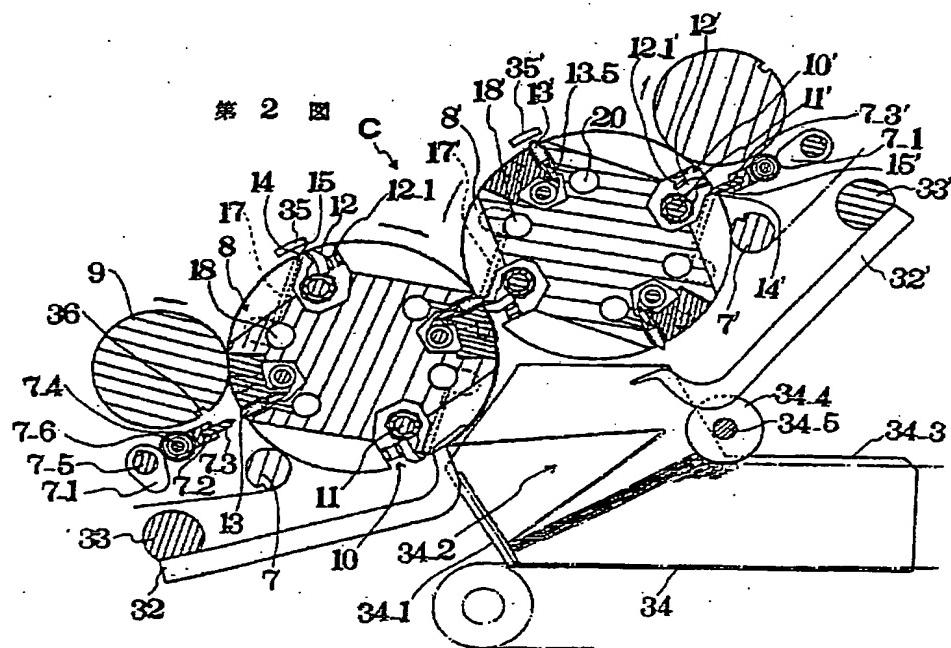
国面は本考案の一実施例を示すものであつて、第1図は本考案装置の全体側面図、第2図は本考案装置の要部の側断面図、第3図は要部の平面図、第4図は同拡大側断面図、第5図は同平面図、第6図は同詳細平面図、第7図は同側断面図、第8図は要部の拡大側面図、第9図は本考案要部部品の側面図、第10図は第9図I-I線における断面図、第11図は要部の拡大側断面図、第12図は要部部品の斜視図、第13図から第15図までは作動状態を示す拡大側断面図、第16図は本考案要部の斜視図である。

7, 7' ……ガイドロール、9, 9' ……タッチロール、8, 8' ……折りたたみドラム、10, 10' ……凹溝、11, 11' ……横軸、12, 12' ……開閉部材、13, 13' ……凸条、13-2, 13-2' ……吸引通路、13-3, 13-3' ……吸引通路、14, 14' ……吸着面、17, 17', 19, 19' ……空気通路、18, 18', 20, 20' ……横通路、21, 21' ……切換バルブ、21-1, 21-1' ……ドラム側板、21-3, 21-4 ……接続通路、22 ……真空通路、23 ……圧縮空気通路、34 ……送りベルト、34-1 ……案内用受箱、34-2 ……落下口、34-3 ……側壁、34-4 ……送りローラー。

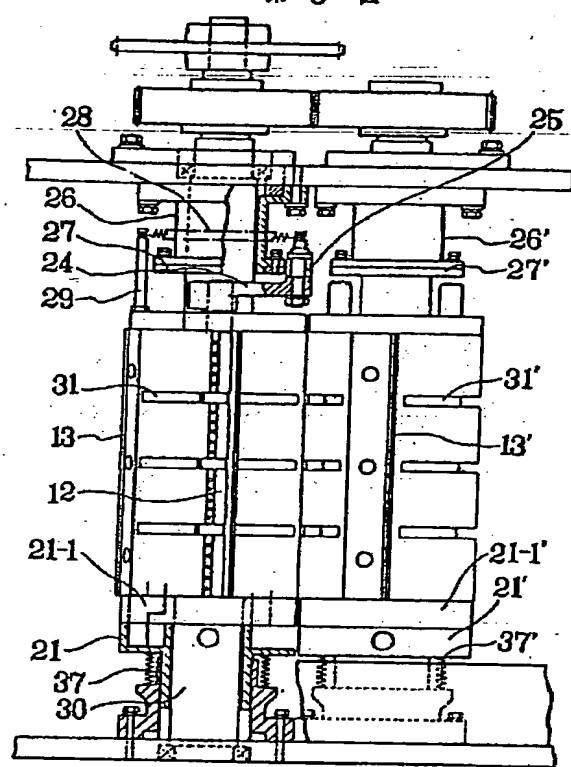
第1図



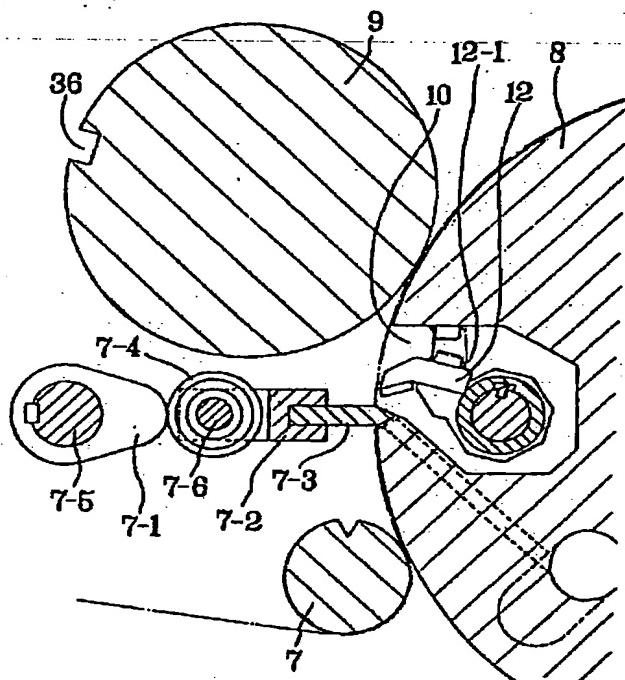
第2図



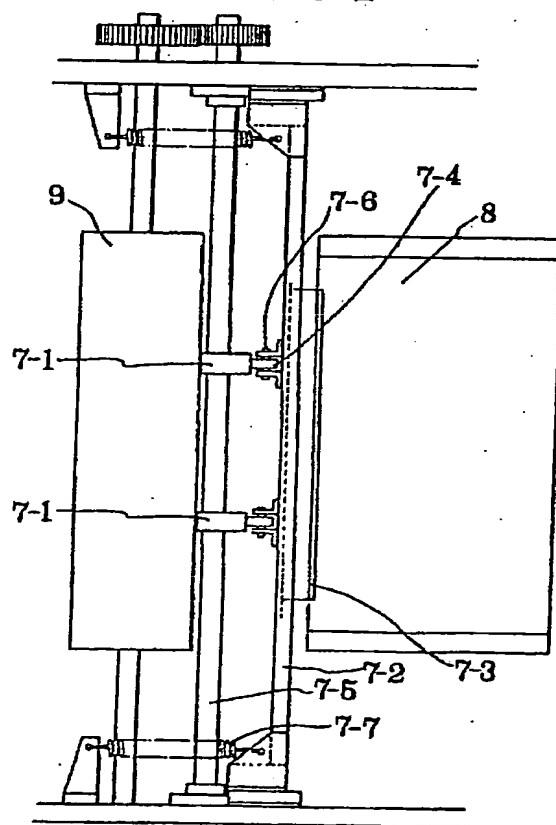
第3図



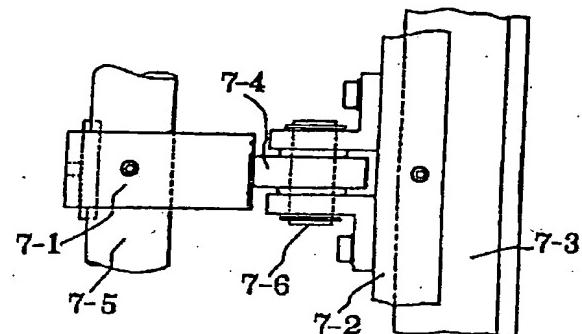
第4図



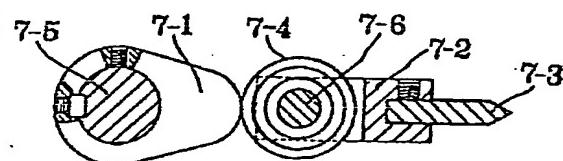
第5図

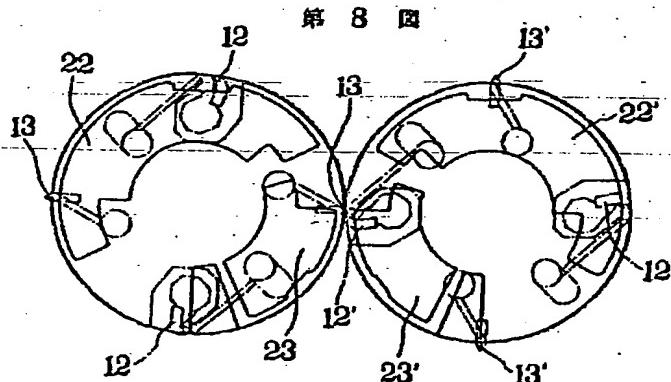


第6図

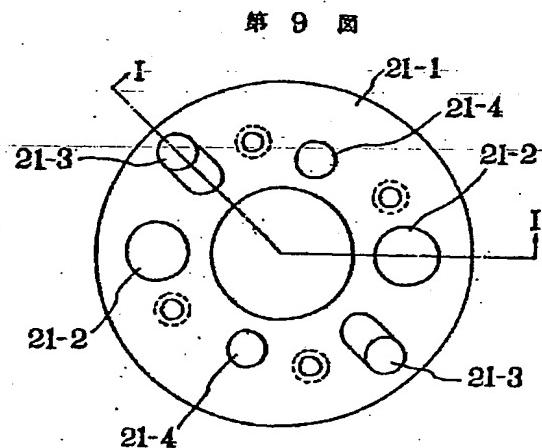


第7図

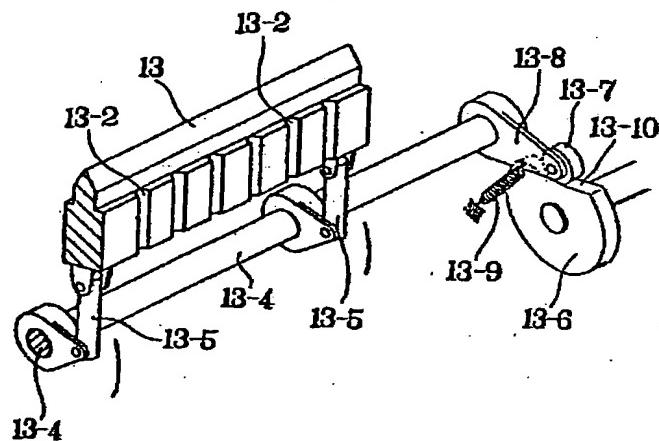




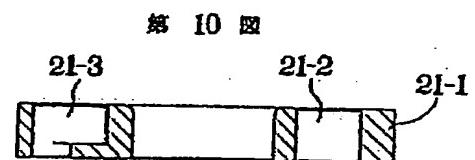
第 8 図



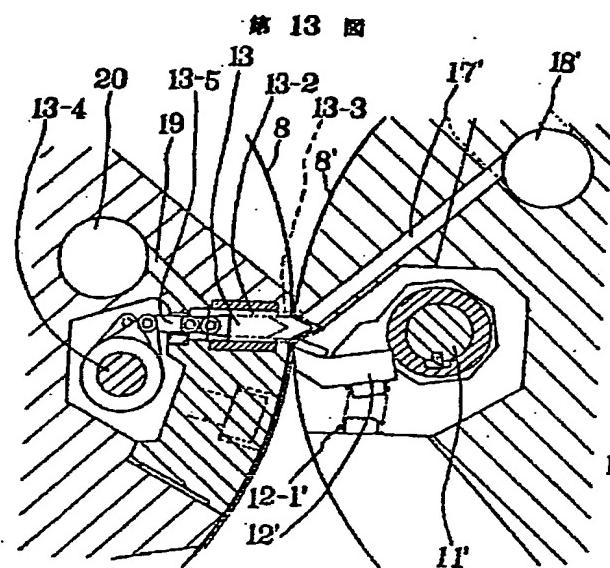
第 9 図



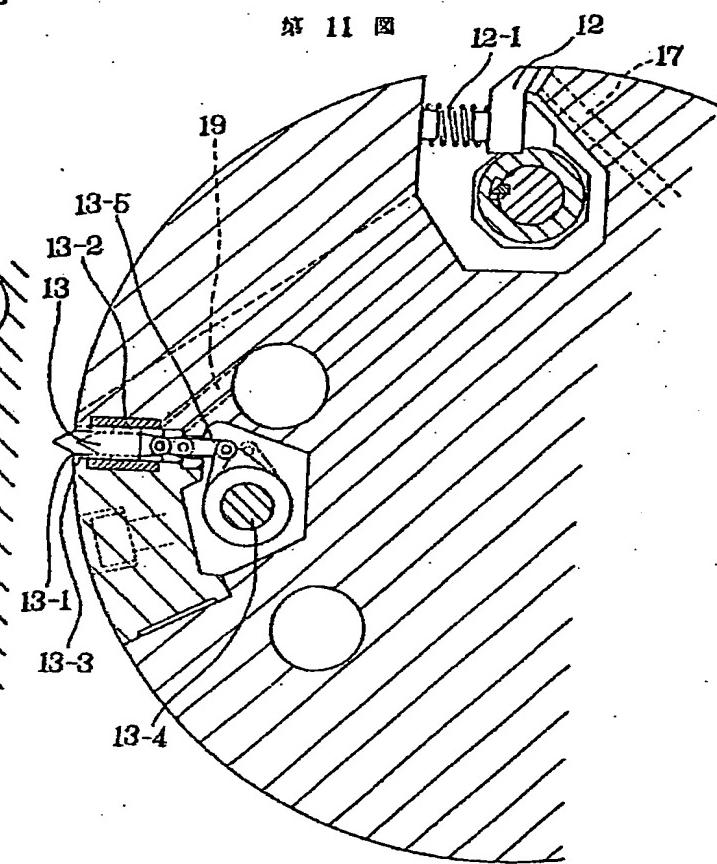
第 12 図



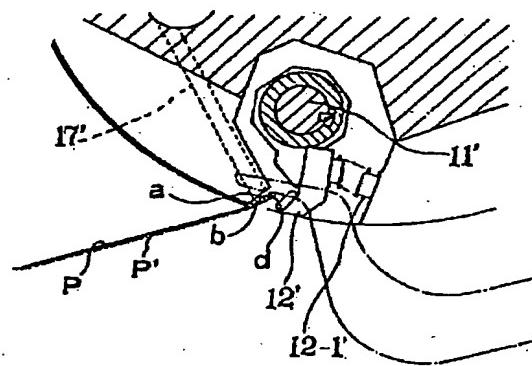
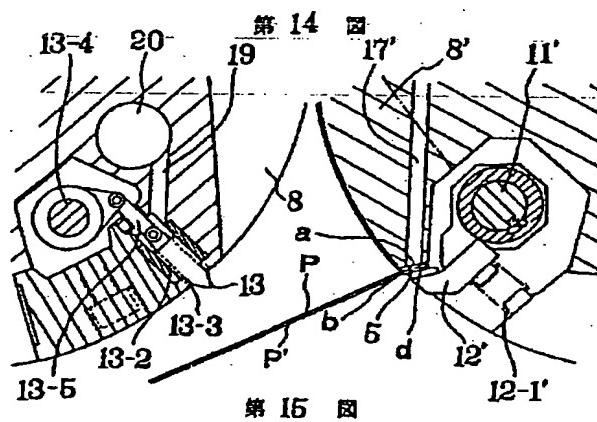
第 10 図



第 13 図



第 11 図



第16図

